

Emergence of Domestically Acquired AmpC-Mediated Ceftriaxone-Resistant *Salmonella* serotype Typhimurium (ST) Infections

Dunne E, Fey P, Shillam P, Kludt P, Keene W, Harvey E, Stamey K, Barrett T, Marano N, Angulo F

Background: Ceftriaxone is an antimicrobial agent commonly used for severe *Salmonella* infections, especially in children. Before 1996, only 3 cases of ceftriaxone-resistant *Salmonella* infections were reported in the United States, none of which were acquired domestically.

Methods: State public health laboratories in the National Antimicrobial Resistance Monitoring System send every 10th human *Salmonella* isolate to CDC for antimicrobial resistance testing (Sensititre, Accumed, Westlake, OH) to determine minimum inhibitory concentrations (MICs). Patients with ceftriaxone resistant ST infections (MICs > 16 µg/µl) were interviewed and the isolates from these patients were evaluated by pulsed-field gel electrophoresis (PFGE), phage typing and characterization of ceftriaxone resistance.

Results: Ceftriaxone resistant *Salmonella* isolates increased from 0.07% (1/1272) in 1996, to 0.67% (10/1476) in 1998. Twelve (75%) of the 16 ceftriaxone-resistant isolates were from children and 12 (75%) were ST. Nine of 12 (75%) patients with ceftriaxone-resistant ST were interviewed; none took antibiotics in the 4 weeks before illness and only one traveled outside the United States. The 12 isolates had different PFGE patterns and phage types, however eleven (92%) of 12 ST isolates were positive for a PCR product specific for the AmpC gene of *Citrobacter freundii*, suggesting a plasmid mediated beta lactamase related to the BIL-1, LAT-1, CMY-2 family of cephamycinases.

Conclusion: Domestically acquired ceftriaxone-resistant *Salmonella*, most of which is ST, has increased in the United States. There were diverse subtyping results, but most ceftriaxone-resistant ST isolates had evidence of the same mechanism of resistance. Because ceftriaxone is critical for the treatment of severe *Salmonella* infections, particularly in children, continued surveillance and further studies on ceftriaxone-resistant *Salmonella* are necessary.

Suggested citation:

Dunne E, Fey P, Shillam P, Kludt P, Keene W, Harvey E, Stamey K, Barrett T, Marano N, Angulo F. Emergence of domestically acquired AmpC-mediated ceftriaxone-resistant *Salmonella* serotype Typhimurium (ST) infections. 39th Interscience Conference on Antimicrobial Agents and Chemotherapy. San Francisco, CA, September 1999.